

**Amendment**

Applicant: Jeffrey Allen Neilsen et al.

Serial No.: 10/603,896

Filed: June 24, 2003

Docket No.: 100201650-1

Title: METHODS AND SYSTEMS FOR PRODUCING IMPROVED COLORING IN AN OBJECT  
PRODUCED THROUGH SOLID FREEFORM FABRICATION

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**IN THE CLAIMS**

Please cancel claims 20-47 without prejudice.

Please add claims 48-64.

Please amend claims 1, 3, 7-10, and 15 as follows:

1. (Currently Amended) A method of improving color quality in an object created by a solid freeform fabrication system that uses a fluid ejection process to build successive layers of the object being fabricated, the method comprising:
  - ejecting a first material to form a layer of a three-dimensional object, the first material containing a colorant;
  - providing a second material; and
  - causing a reaction between the first material and the second material that keeps the colorant near a surface of the object,
  - wherein the first material comprises a binder or a build material, and the second material comprises a binder or a build material.
2. (Original) The method of claim 1, wherein causing a reaction comprises precipitating the colorant out of the first material.
3. (Currently Amended) The method of claim 2, wherein causing a reaction further comprises ~~providing a second material to precipitate~~ the second material precipitating the colorant out of the first material.
4. (Original) The method of claim 3, wherein ejecting a first material comprises ejecting a binder.
5. (Original) The method of claim 4, wherein providing a second material comprises ejecting a second binder.

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6. (Original) The method of claim 4, wherein providing a second material comprises providing a powdered build material into which the first material is ejected.
7. (Currently Amended) The method of ~~claim 3~~ claim 1, wherein ejecting a first material comprises ejecting a solidifiable build material.
8. (Currently Amended) The method of ~~claim 7~~ claim 1, wherein providing a second material comprises ejecting a solidifiable support material.
9. (Currently Amended) The method of claim 2, wherein ~~causing a reaction to precipitate~~ precipitating the colorant out of the first material comprises causing a pH reaction.
10. (Currently Amended) The method of claim 9, wherein the colorant in the first material is sensitive to pH, and wherein causing a pH reaction comprises ~~providing a~~ the second material having a pH sufficiently different from a pH of the first material to cause the colorant to precipitate out of the first material upon contact of the first and second materials.
11. (Original) The method of claim 10, wherein the pH of the second material is lower than the pH of the first material.
12. (Original) The method of claim 11, wherein the colorant in the first material is a dye selected from the group consisting of carboxylated azo dyes, carboxylated copper phthalocyanine dyes, carboxylated xanthene dyes, and dyes whose solubility decreases as pH is lowered.
13. (Original) The method of claim 10, wherein the pH of the second material is higher than the pH of the first material.
14. (Original) The method of claim 10, wherein the pH differential between the first material and the second material ranges from about 2.5 to 7 units.

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15. (Currently Amended) The method of claim 2, wherein ~~causing a reaction to precipitate~~ precipitating the colorant out of the first material comprises causing an anionic-cationic reaction.

16. (Original) The method of claim 15, wherein the colorant of the first material is anionic, and wherein causing a reaction comprises providing a cationic second material to cause the colorant to precipitate out of the first material upon contact of the first and second materials.

17. (Original) The method of claim 15, wherein the colorant of the first material is cationic, and wherein causing a reaction comprises providing an anionic second material to cause the colorant to precipitate out of the first material upon contact of the first and second materials.

18. (Original) The method of claim 1, wherein the colorant is a dye.

19. (Original) The method of claim 1, wherein the colorant is a pigment.

20-47. (Cancelled)

48. (New) A method of improving color quality in a three-dimensional object created by a solid freeform fabrication system that uses a fluid ejection process to build successive layers of the three-dimensional object being fabricated, the method comprising:

forming a layer of the three-dimensional object, including providing contact between a first material and a second material, the first material containing a colorant; and

precipitating the colorant out of the first material upon contact of the first and second materials,

wherein the first material comprises a binder or a build material, and the second material comprises a binder or a build material.

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49. (New) The method of claim 48, wherein precipitating the colorant out of the first material keeps the colorant near a surface of the object.
50. (New) The method of claim 48, wherein the first material comprises a binder.
51. (New) The method of claim 50, wherein the second material comprises a second binder.
52. (New) The method of claim 50, wherein the second material comprises a powdered build material into which the first material is ejected.
53. (New) The method of claim 48, wherein the first material comprises a solidifiable build material.
54. (New) The method of claim 48, wherein precipitating the colorant out of the first material comprises causing a pH reaction.
55. (New) The method of claim 48, wherein the colorant in the first material is sensitive to pH, and wherein causing a pH reaction comprises the second material having a pH sufficiently different from a pH of the first material to cause the colorant to precipitate out of the first material upon contact of the first and second materials.
56. (New) The method of claim 55, wherein the pH of the second material is lower than the pH of the first material.
57. (New) The method of claim 56, wherein the colorant in the first material is a dye selected from the group consisting of carboxylated azo dyes, carboxylated copper phthalocyanine dyes, carboxylated xanthene dyes, and dyes whose solubility decreases as pH is lowered.

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58. (New) The method of claim 55, wherein the pH of the second material is higher than the pH of the first material.

59. (New) The method of claim 55, wherein the pH differential between the first material and the second material ranges from about 2.5 to 7 units.

60. (New) The method of claim 48, wherein precipitating the colorant out of the first material comprises causing an anionic-cationic reaction.

61. (New) The method of claim 60, wherein the colorant of the first material is anionic, and wherein causing an anionic-cationic reaction comprises providing a cationic second material to cause the colorant to precipitate out of the first material upon contact of the first and second materials.

62. (New) The method of claim 60, wherein the colorant of the first material is cationic, and wherein causing an anionic-cationic reaction comprises providing an anionic second material to cause the colorant to precipitate out of the first material upon contact of the first and second materials.

63. (New) The method of claim 48, wherein the colorant is a dye.

64. (New) The method of claim 48, wherein the colorant is a pigment.